Report for 2001GU1344B: Water Resources Training For The Commonwealth of the Northern Marianas Islands

There are no reported publications resulting from this project.

Report Follows:

PROJECT SYNOPSIS REPORT

Title: Water Resources Training For The Commonwealth of The Northern Mariana's Islands

Problems and Research Objectives:

To have effective island water resources planning and management requires having a good understanding of the various components of the basic nature of an island's water resources. This is especially true for those making decisions and operating the island's water system. It is also important that water resources managers have an understanding of the technical vocabulary used in various engineering and environmental studies that are commonly carried out in the water resources area. In most cases, managers, supervisors and line employees have a good knowledge of what is going on in their specific field but in many cases their broad general background in water resources is lacking. In response to this need, a six weeks training program was designed for the Commonwealth of the Northern Mariana Islands (CNMI) agencies with the objectives of: 1) providing technical understanding of water resources related issues such as island's meteorology, hydrology, geology, surface and groundwater, and water quality, and 2) to facilitate a long-term development of a partnership between the institute and water resources professionals in the CNMI.

Methodology:

The method used to meet the objectives of the training program included formal lectures, laboratory sessions, and filed trips. Pertinent water resources issues as shown in the attached table were selected. Lectures were augmented with detailed handouts, overheads, slide presentations, practical demonstration, and field trips. The training was conducted from June 27 through August 24, 2002 in Saipan at the Saipan Commonwealth Utility Corporation training facility. Each of the six topics was presented in two days followed by a field trip. Fourteen (14) students from Division of Environmental Quality (DEQ), Commonwealth Utility Corporation (CUC), and Division of Coastal Resources Management (DCRM) participated in this training.

A certificate of completion was awarded to the students who successfully completed the training.

Principal Findings and Significance:

The significant accomplishments of this six weeks training was a better understanding of various water resources related issues such as:

1. Knowledge of how the geology of the islands dictates the movement of water above and under the ground.
2. An appreciation of the various tests that are used to help us assure that our surface and groundwater is safe for drinking.

3. An appreciation for the hydrologic cycle and the rainfall runoff process that regulates how much of the rain makes its way into useful runoff and groundwater.
4. An understanding of how water moves under the ground and the potential for contamination of that resource.
5. An understanding of how water is delivered from source to consumer through a water distribution system.
6. Learning about tropical island meteorology with emphasis on rainfall, the ultimate source of our waters.

Table 1. Topics for CNMI's Water Resources Training

SESSION/INSTRUCTOR	TOPICS
Water Quality (Session 1) Dr. Gary Denton	• Bacteriology • Indicator organisms • Health and aesthetic aspects (physical parameters)
Water Quality (Session 2) Dr. Gary Denton	• Health and aesthetic aspects (Chemical Parameters inorganic) • Health and aesthetic aspects (Chemical Parameters organic) • Chlorination
Water Quality (Lab Session) Mr. Harold Wood/Dr Gary Denton	• Bacteriology • Colorimetry, titration and field kits • Atomic absorption analysis (demo if available discussion if not) • Gas chromatograph analysis (demo if available discussion if not)
Geology (Session 1) Dr. Galt Siegrist	• Physical and historical geology of the C.N.M.I. Geologic materials of C.N.M.I.
Geology (Session 2) Dr. Galt Siegrist	• Environmental and resource geology of C.N.M.I. • Mineral and water resources • Geologic hazards • Geologic and topographic maps
Geology (Field Trip Session) Dr. Galt Siegrist	• Visit outcrops of geologic features discussed in class
Meteorology (Session 1) Dr. Mark Lander	• Western Pacific climatology • Rainfall distributions in CNMI • Areal distribution of rainfall on high islands
Meteorology (Session 2) Dr. Mark Lander	• Droughts and effects of ENSO • Predicting droughts • Typhoons and tropical storms
Meteorology (Laboratory Session) Dr. Mark lander	• Laboratory exercises • Typhoon plotting • Typhoon related flooding
Hydrogeology (Session 1) Dr. John Jenson Mr. Rob Carruth (Guest Instructor)	• Groundwater occurrence on high volcanic islands • Karst Aquifers • Specifics of CNMI aquifers • Well construction and testing

Table 1. Topics For CNMI's Water Resources Training (continued)

SESSION/INSTRUCTOR	TOPICS
Hydrogeology (Session 2) Dr. John Jenson Mr. Rob Carruth (Guest Instructor)	• Water production and well field management • Salt water intrusion • Groundwater protection strategies • Application of groundwater modeling to groundwater management
Hydrogeology (Lab Session) Dr. John Jenson Mr. Rob Carruth (Guest Instructor)	• Visit Saipan well fields • Visit karst features for examination of characteristics affecting groundwater yields and distribution
Hydrology (Session 1) Dr. Leroy Heitz	• Hydrologic cycle • Measurement units and calculations • Rainfall distribution and storm runoff design • Evaporation and evapotraspiration
Hydrology (Session 2) Dr. Leroy Heitz	• Water budgets • Streamflow measurement and data interpretation • Rain catchment system sizing
Hydrology (Field Trip Session) Dr. Leroy Heitz	• Visit stream gage site and make flow measurement • Visit sites using rooftop rain catchment systems • Computer analysis of rain catchment sites
Water Distribution Systems (Session 1) Dr. Shahram Khosrowpanah	• Hydraulics of pipe flow • Units of measure and calculation • Water budgets in piping systems • Equations for movement of water in piping systems • Losses in piping systems
Water Distribution Systems (Session 2) Dr. Shahram Khosrowpanah	• Water distribution systems components and functions (tanks, valves and piping) • Pumps • Water system demands • Modeling water distribution systems